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EXAMINER	
CURS, NATHAN M	
ART UNIT	**PAPER NUMBER**
2613	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/561,546	SANCHEZ, JORGE	
	Examiner	Art Unit	
	NATHAN M. CURS	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 August 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,9,12 and 15-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *2-4 and 15* is/are allowed.

6)☒ Claim(s) *1,9,12 and 16-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/09*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12 in lines 5 and 6 recites "the laser transceiver"; it's not clear which of the previously two recited transceivers is being referred to.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1, 9, and 19-21** are rejected under 35 U.S.C. 102(b) as being anticipated by **Link et al.** (US 5,526,164 A).

Regarding **claim 1**, Link et al. disclose a method for controlling a light emitting device (Figure 3) comprising:

modulating an input of a light emitting device (laser diode 2) with both a test signal ("pulsed pilot signal" f_{PILOT} shown in Figure 3) and a data signal ("data signal" f_D)

to produce a modulated optical output signal, wherein the test signal is a noise-level test signal (Figure 1 shows how the intensity of f_{PILOT} is significantly smaller than that of the main data signal and is “noise” relative to the data signal);

acquiring the modulated optical output signal from the light emitting device (using photocell 3);

extracting the test signal from the acquired modulated optical output signal by applying a copy of the test signal to the acquired modulated optical output signal (column 6, lines 44-62, where the f_{PILOT} applied to demodulator 7 reads on a copy of the original f_{PILOT});

digitally processing the extracted test signal to calculate one or more power control adjustments (column 7, lines 60-67; column 8, lines 1-14); and

controlling output power of the light emitting device by applying the calculated power control adjustments (i.e., as voltage signals U_0 and U_{mod} and corresponding current signals I_0 and I_{mod}) to the light emitting device (column 6, lines 44-67; column 7, lines 1-47).

Regarding **claim 9**, Link et al. disclose an apparatus (Figure 3) comprising:

a laser driver (including driver 24 and summer 27) configured to modulate an input of a laser with both a data signal (“data signal” f_D shown in Figure 3) and a test signal (“pulsed pilot signal” f_{PILOT}) to produce a modulated laser output, wherein the test signal is a noise-level test signal (Figure 1 shows how the intensity of f_{PILOT} is significantly smaller than that of the main data signal and is “noise” relative to the data signal);

a monitor photodiode (photocell 3) operatively coupled to the laser, configured to acquire the modulated laser output, and further configured to generate a modulated laser output signal from the modulated laser output (column 6, lines 44-62);

a digital signal processor (including elements such as demodulator 7) operatively coupled to the monitor photodiode, configured to generate an extracted test signal from the modulated laser output signal by applying a copy of the test signal to the modulated laser output signal, further configured to determine an average value of the extracted test signal (column 6, lines 44-64, where the f_{PILOT} applied to demodulator 7 reads on a copy of the original f_{PILOT}), and further configured to calculate a laser bias current adjustment from the average value of the extracted test signal (i.e., current signal I_0 corresponding to voltage signal V_0; column 7, lines 60-67; column 8, lines 1-14); and

a servo (including microcontroller 13) operatively coupled to the digital signal processor and configured to apply the laser bias current adjustment to the laser (i.e., current signal I_0 corresponding to voltage signal V_0; column 6, lines 44-67; column 7, lines 1-47).

Regarding **claim 19**, Link et al. disclose that the digitally processing comprises determining a ratio of a slope of the test signal being applied to the light emitting device to a slope of the extracted test signal to calculate the one or more power control adjustments (column 3, lines 32-45; column 7, lines 48-67; column 8, lines 1-55).

Regarding **claim 20**, Link et al. disclose a signal conditioner (including filters 5 and 6), operatively coupled to the monitor photodiode 3 configured to function as a

coarse filter to isolate noise and the test signal from the modulated laser output signal (column 6, lines 44-64).

Regarding **claim 21**, Link et al. The apparatus of claim 9, wherein the monitor photodiode 3 is a high frequency response photodiode configured to track the modulated laser output (column 6, lines 40-48).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claim 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Levin et al.** (US 4,994,675 A) in view of **Link et al.** (US 5,526,164 A).

Regarding **claim 12**, Levin et al. disclose a method for controlling a laser system (Figure 3), the method comprising:

receiving, at a laser transceiver (i.e., the “Point B” transceiver including receiver 18 and transmitter 30) from another laser transceiver (i.e., the “Point A” transceiver including transmitter 15 and receiver 33), a transmitted signal, wherein the transmitted signal includes both a data signal (“A to B Information Signal”) and an embedded test signal (i.e., “XX Test Signal”), and wherein the embedded test signal is embedded in system noise (column 6, lines 11-30; column 7, lines 24-27);

detecting, by the laser transceiver, the transmitted signal, and recovering, by the laser transceiver, the test signal, and digitally processing the test signal at the laser transceiver to determine a laser characteristic of the other laser transceiver (using elements 19, 22, and 23; column 6, lines 36-53); and

transmitting, by the laser transceiver to the other laser transceiver, the laser characteristic to enable the other laser transceiver to adjust one or more operating characteristics according to the transmitted laser characteristic (using elements 25 and 26; column 6, lines 54-57; column 7, lines 24-49).

Regarding claim 12, Examiner respectfully notes that Levin et al. disclose a test signal “embedded in system noise” at least in the sense that the disclosed test signal (i.e., “XX Test Signal” shown in Figure 3) has a level that is very low compared to the level of the data signal (column 5, lines 56-58) and would be well understood in the optical communications art as being “noise” relative to the main data signal.

Further regarding claim 12, Levin et al. disclose extracting the test signal from the acquired modulated optical output signal using a filter but do not specifically disclose that the test signal is recovered by applying a copy of the test signal to the transmitted signal. Link et al. disclose extracting a test signal from an acquired signal by filteringing and then applying a copy of the test signal (column 6, lines 44-62, where the f_{PILOT} applied to demodulator 7 reads on a copy of the original f_{PILOT}). One of ordinary skill in the art at the time of the invention could have extracted the test signal from the acquired signal by filtering and applying a copy of the test signal, as taught by Link et al. in place of the filtering in Levin et al. and the results would have been predictable; namely, the

test signal would be extracted using an alternative extraction method. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to extract the test signal from the acquired signal by filtering and applying a copy of the test signal, as taught by Link et al., in place of the filtering in Levin et al., for the predictable results of extracting the test signal using an alternative extraction method.

7. **Claims 16, 23, and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Link et al.** (US 5,526,164 A) in view of **Walker** (US 5,889,802 A).

Regarding **claims 16 and 24**, Link et al. disclose a method and system as discussed above with regard to claims 1 and 9 respectively, including extracting the test signal from the acquired modulated optical output signal, but they do not specifically disclose a phase-sensitive lock-in detection algorithm. However, various signal detection algorithms are known in the communications art. In particular, Walker teach a system that is related to the one disclosed by Link et al., including using a noise-level test signal to control a laser (Figure 6; column 8, lines 28-31), and Walker further teaches using lock in detection (column 8, lines 50-53). Regarding claims 16 and 24, it would have been obvious to a person of ordinary skill in the art to use lock in detection as taught by Walker in the system disclosed by Link et al. as an engineering design choice of a way to achieve a predictable result of effectively detecting and recovering the signal. Again, the claimed differences exist not as a result of an attempt by Applicants to solve an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art.

Regarding **claim 23**, Link et al. disclose a system as discussed above with regard to claim 9, but they do not specifically disclose that the test signal is a sawtooth signal. However, various signal shapes are well known in the communications art. In particular, Walker teach a system that is related to the one disclosed by Link et al., including using a noise-level test signal to control a laser (Figure 6; column 8, lines 28-31). Walker further teaches that various waveforms may be used for the test signal, including a sawtooth test signal (column 9, lines 1-44). Regarding claim 23, it would have been obvious to a person of ordinary skill in the art to use a sawtooth signal as taught by Walker in the system disclosed by Link et al. as an engineering design choice of an effective signal shape for implementing the already-disclosed noise-level test signal. The claimed differences exist not as a result of an attempt by Applicants to solve an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art.

8. **Claims 17 and 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Link et al.** in view of **Wax** (US 4,164,036 A).

Regarding **claims 17 and 25**, Link et al. disclose a method and system as discussed above with regard to claims 1 and 9 respectively, including extracting the test signal from the acquired modulated optical output signal, but they do not specifically disclose a phase insensitive quadrature detection algorithm. However, various signal detection algorithms are known in the communications art. In particular, Wax teach a system that is related to the one disclosed by Link et al., including detecting a frequency

tone in a signal (Abstract), and Wax further teaches using a phase insensitive quadrature detection algorithm (column 5, lines 33-44). Regarding claims 17 and 25, it would have been obvious to a person of ordinary skill in the art to use quadrature detection as taught by Wax in the system disclosed by Link et al. as an engineering design choice of a way to achieve a predictable result of effectively detecting and recovering the signal. Again, the claimed differences exist not as a result of an attempt by Applicants to solve an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art.

9. **Claim 18** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Link et al.** in view of **Walker** and **Matsuo et al.** (US 4,168,398 A).

Regarding **claim 18**, Link et al. disclose a method as discussed above with regard to claim 1, but they do not specifically disclose that the test signal is a sawtooth signal. However, various signal shapes are well known in the communications art. In particular, Walker teach a system that is related to the one disclosed by Link et al., including using a noise-level test signal to control a laser (Figure 6; column 8, lines 28-31). Walker further teaches that various waveforms may be used for the test signal, including a sawtooth test signal (column 9, lines 1-44). Regarding claim 18, it would have been obvious to a person of ordinary skill in the art to use a sawtooth signal as taught by Walker in the system disclosed by Link et al. as an engineering design choice of an effective signal shape for implementing the already-disclosed noise-level test signal. The claimed differences exist not as a result of an attempt by Applicants to solve

an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art.

Further regarding claim 18, in the method described by Link et al. in view of Walker, Link et al. disclose extracting the test signal from the acquired modulated optical output signal, but they do not specifically disclose a linear sweep algorithm. However, various signal detection algorithms are known in the communications art. In particular, Matsuo et al. teach a system that is related to the one described by Link et al. in view of Walker, including detecting a signal in a communication system, and Matsuo et al. further teach using a linear sweep algorithm (Abstract). Regarding claim 26, it would have been obvious to a person of ordinary skill in the art to use a linear sweep algorithm as taught by Matsuo et al. in the system described by Link et al. in view of Walker as an engineering design choice of a way to achieve a predictable result of effectively detecting and recovering the signal. Again, the claimed differences exist not as a result of an attempt by Applicants to solve an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art.

10. **Claim 22** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Link et al.** in view of **Habel et al.** (US 5,579,328 A).

Regarding **claim 22**, Link et al. disclose a system as discussed above with regard to claim 9 but do not specifically disclose a transimpedance amplifier. However, Habel et al. teach a system (Figure 1) that is related to the one described by Link et al.

including laser diode 12 for producing a modulated laser output, a monitor photodiode 22 for acquiring the modulated laser output, and a processor 18 for receiving the output from the photodiode (column 3, lines 15-38). Habel et al. further teach a transimpedance amplifier 26 coupled to the monitor photodiode and configured to amplify the modulated laser output signal (column 3, lines 26-29). Regarding claim 22, it would have been obvious to a person of ordinary skill in the art to include a transimpedance amplifier as taught by Habel et al. in the system disclosed by Link et al. in order to ensure that the output from the photodiode is received by other elements at a suitable power level for effective signal recovery and processing.

11. **Claim 26** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Link et al.** in view of **Matsuo et al.**

Regarding **claim 26**, Link et al. disclose a method and system as discussed above with regard to claim 9, including extracting the test signal from the acquired modulated optical output signal, but they do not specifically disclose a linear sweep algorithm. However, various signal detection algorithms are known in the communications art. In particular, Matsuo et al. teach a system that is related to the one disclosed by Link et al., including detecting a signal in a communication system, and Matsuo et al. further teach using a linear sweep algorithm (Abstract). Regarding claim 26, it would have been obvious to a person of ordinary skill in the art to use a linear sweep algorithm as taught by Matsuo et al. in the system disclosed by Link et al. as an engineering design choice of a way to achieve a predictable result of effectively

detecting and recovering the signal. Again, the claimed differences exist not as a result of an attempt by Applicants to solve an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art.

Allowable Subject Matter

12. **Claims 2-4 and 15** are allowed.

Response to Arguments

13. Applicant's arguments filed 21 August 2009 have been fully considered but they are not persuasive.

Regarding claims 1 and 9 and the rejections based on Link, Applicant argues that the pilot signal of Link is not expressly disclosed as a noise-level signal. However, the term "noise-level" in the claims is a relative term implying a lower level signal, but without specific quantitative weight. Link's pilot signal being two orders of magnitude lower in amplitude than the data signal qualifies it a "noise-level" signal relative to the data signal.

Regarding the newly added clauses in claims 1 and 9 directed to applying a copy of the test signal, contrary to Applicant's arguments this is disclosed by Link, where a copy of f_{PILOT} is applied via demodulator 7 of fig. 3 to the acquired signal. The newly added language is essentially a reintroduction of limitations from original claim 13, which was previously rejected based on Link.

Applicant's arguments regarding amended claim 12 are moot in view of the new grounds of rejection.

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATHAN M. CURS whose telephone number is (571)272-3028. The examiner can normally be reached on 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571) 272-3078. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NATHAN M CURS/

Primary Examiner, Art Unit 2613